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[54] **CONNECTOR FOR ENGAGING BRAKE CABLES**

5,431,256 7/1995 Wen 403/303

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[21] Appl. No.: **390,664**

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[57] ABSTRACT

[51] Int. Cl.⁶ **F16C 1/10**

[52] U.S. Cl. **74/502.4; 74/502.6; 188/24.19; 188/24.21; 188/24.22; 188/2 D; 403/303**

[58] Field of Search **74/502.4, 502.6, 74/501.5 R; 188/24.19, 24.21, 2 D, 196 M, 196 V, 24.22; 403/303; 192/111 A**

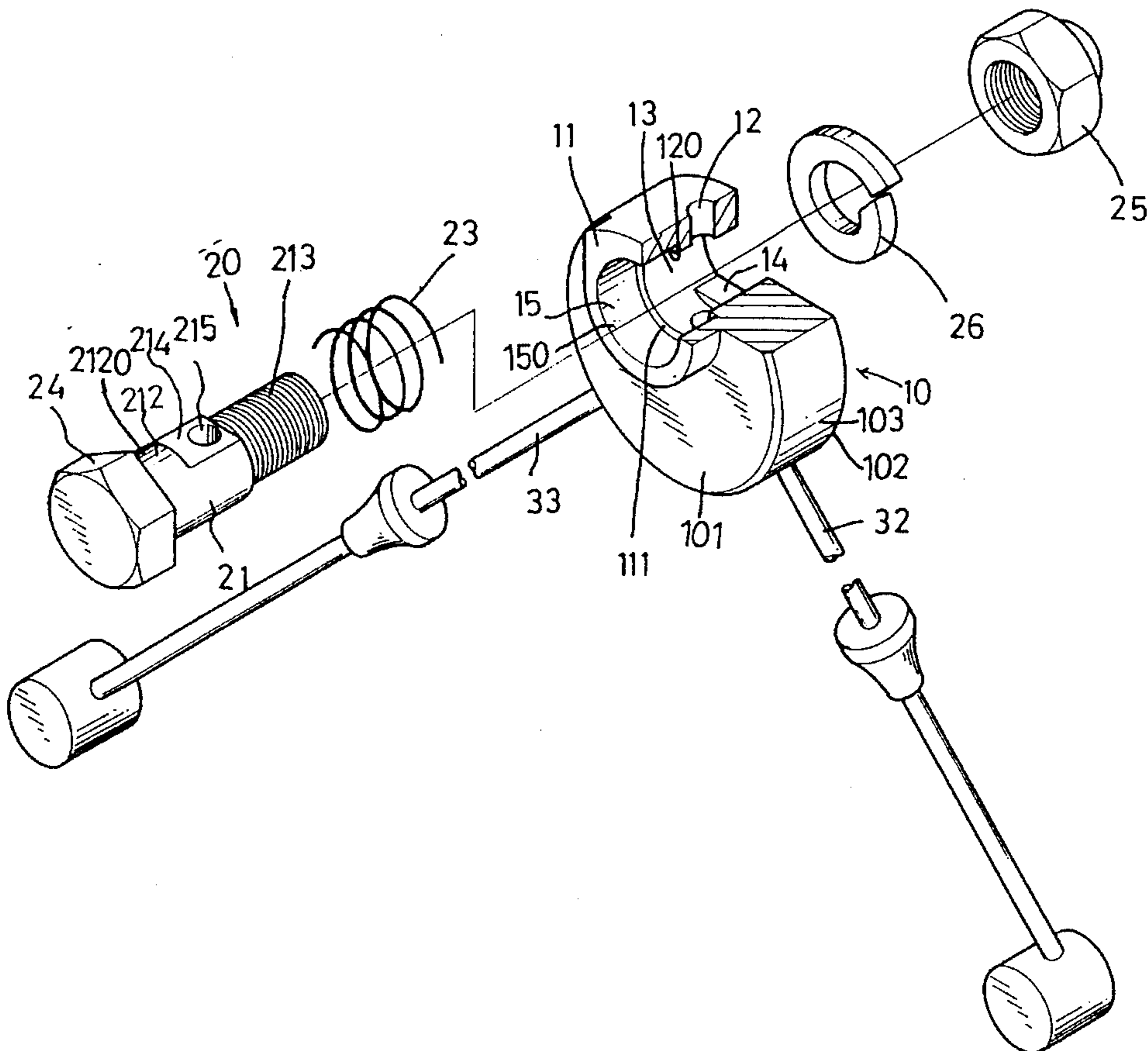
A connector for engaging brake cables of a bicycle, the connector has a bore defined therein, a counter-bore defined therein and in communication with the bore, and a first hole transversely defined therein which is in communication with and perpendicular to the bore through which a bolt extends. A first brake cable and a second brake cable respectively extend from the connector and connect to a corresponding brake arm thereof, a third brake cable extending to connect a brake lever at a first end thereof and passing through a second hole defined in the bolt and extending through the first hole with a second end thereof, the bolt engaged to a nut via a spring and a washer so as to securely position the third brake cable such that the third brake cable is able to be adjusted by unscrewing the bolt and the first cable and the second brake cable exerting an equal force to the corresponding brake arms thereof when the connector is pulled upwardly by the third brake cable.

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5 Claims, 6 Drawing Sheets



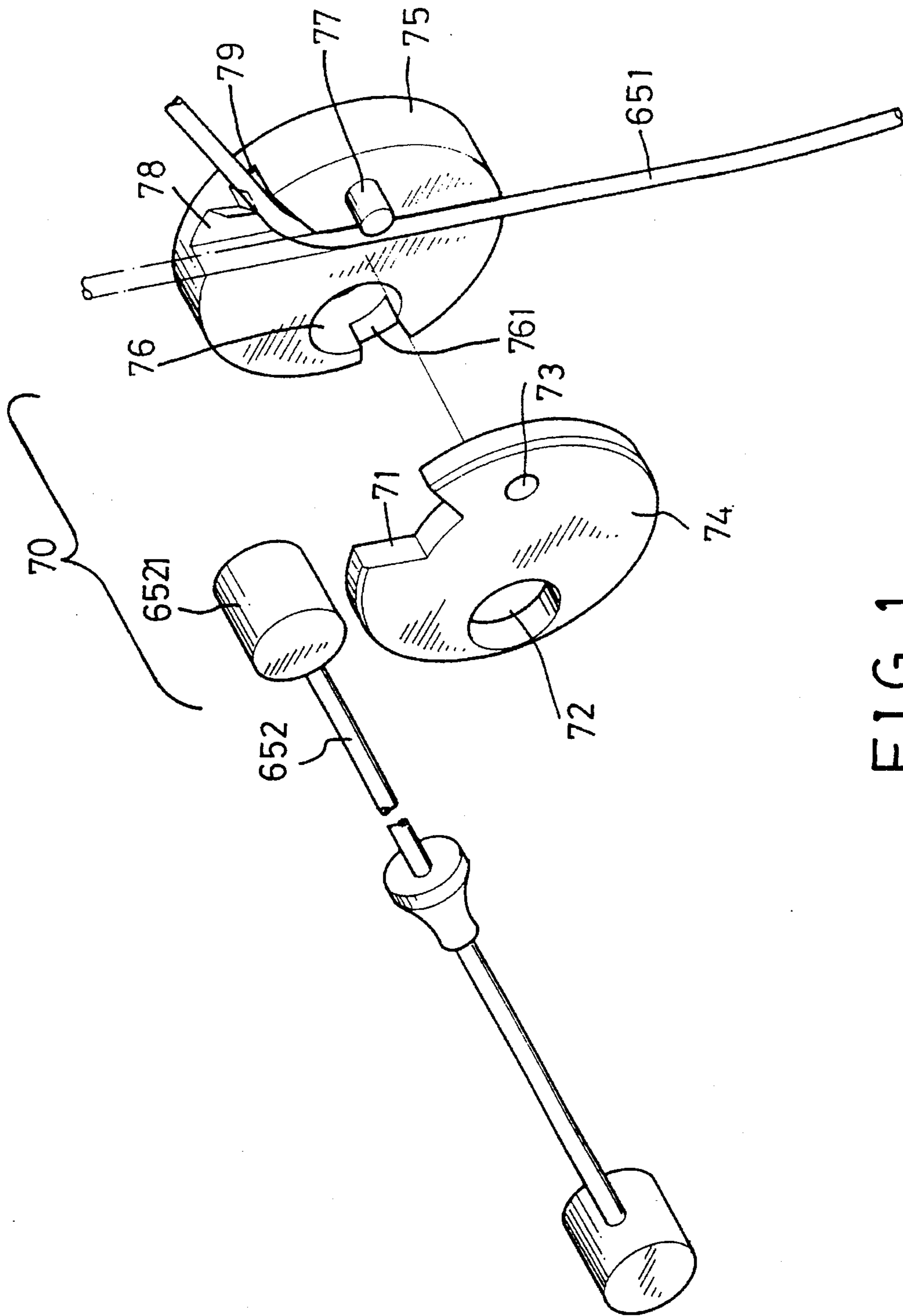


FIG. 1
PRIOR ART

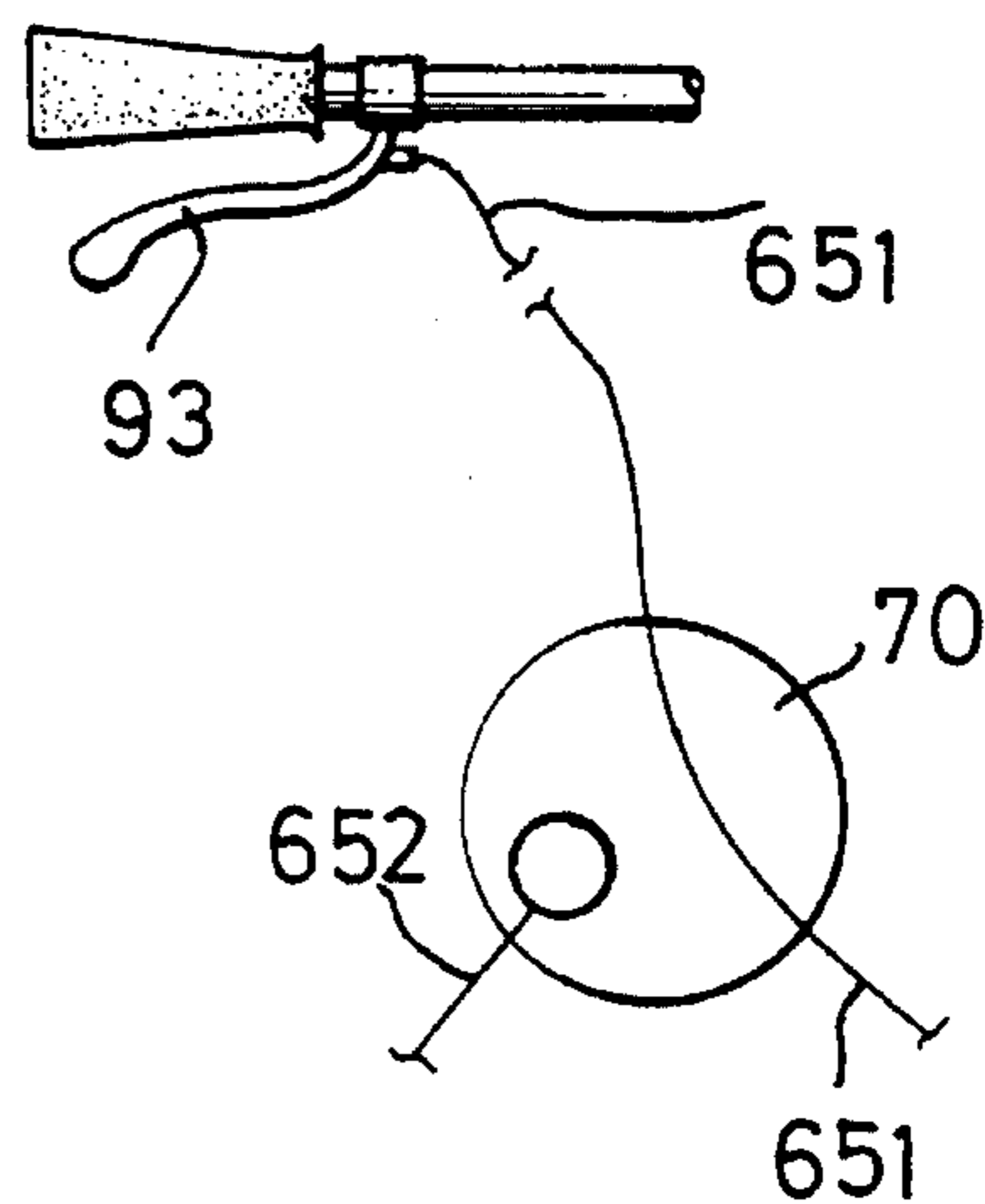


FIG. 3
PRIOR ART

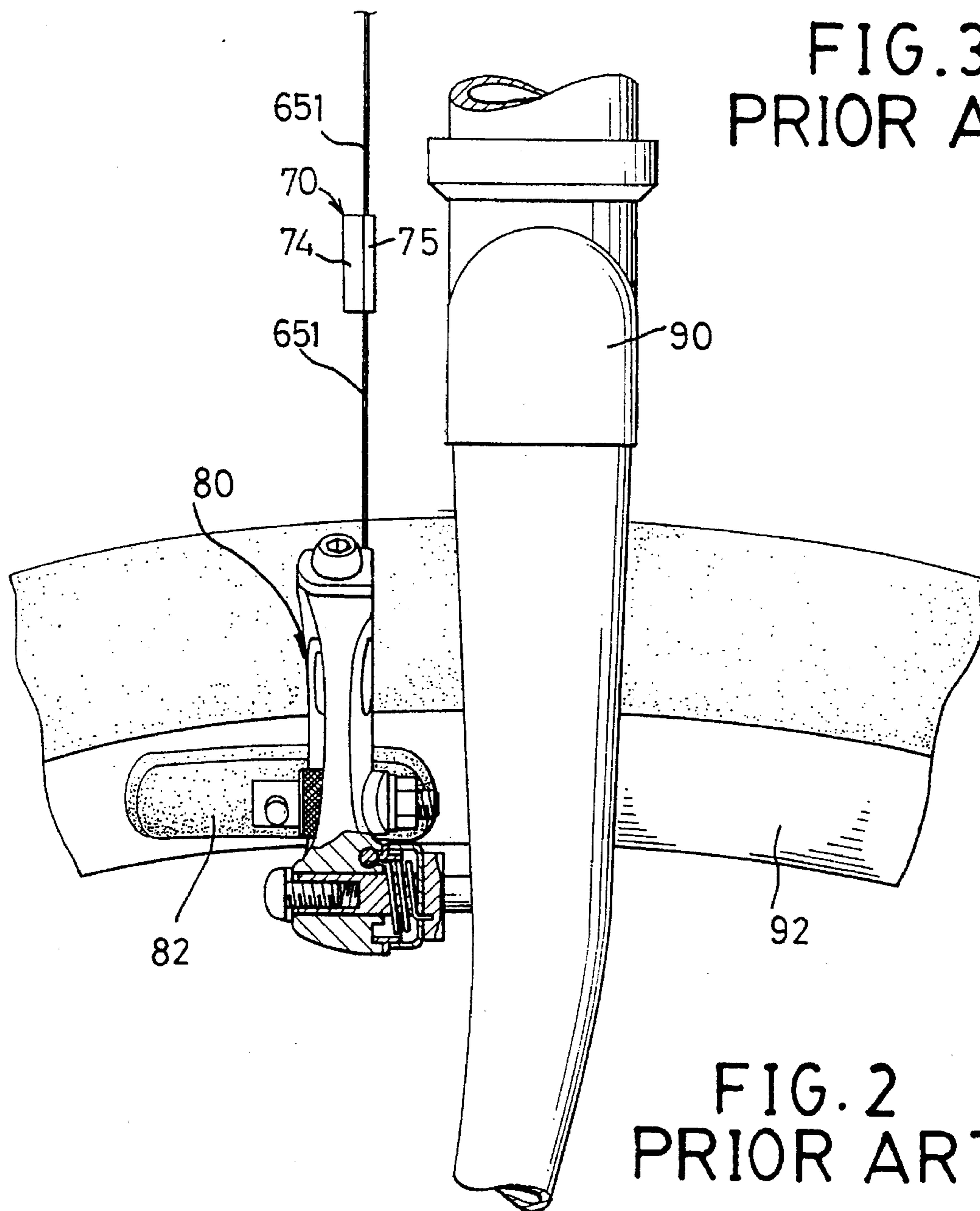
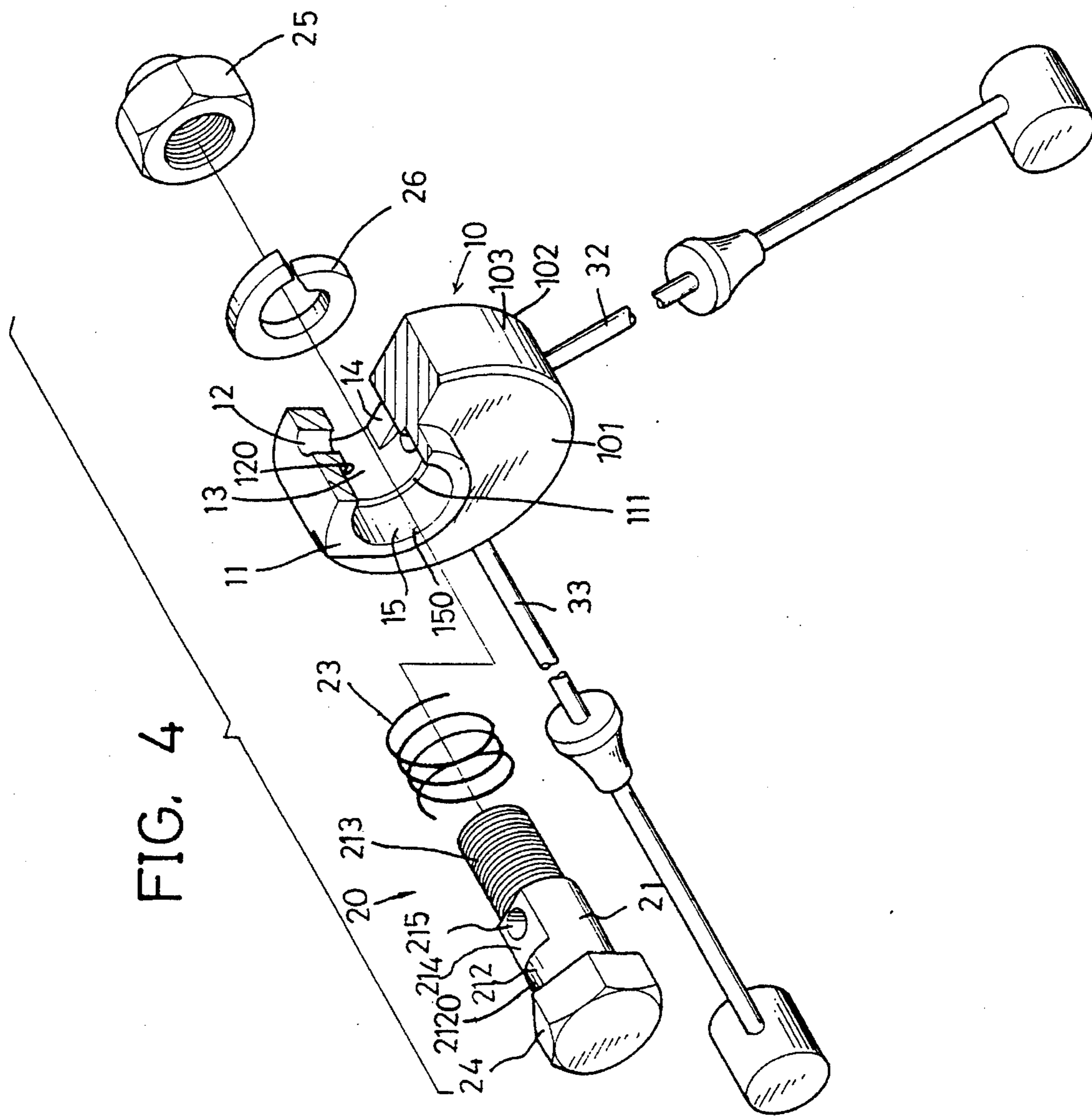


FIG. 2
PRIOR ART



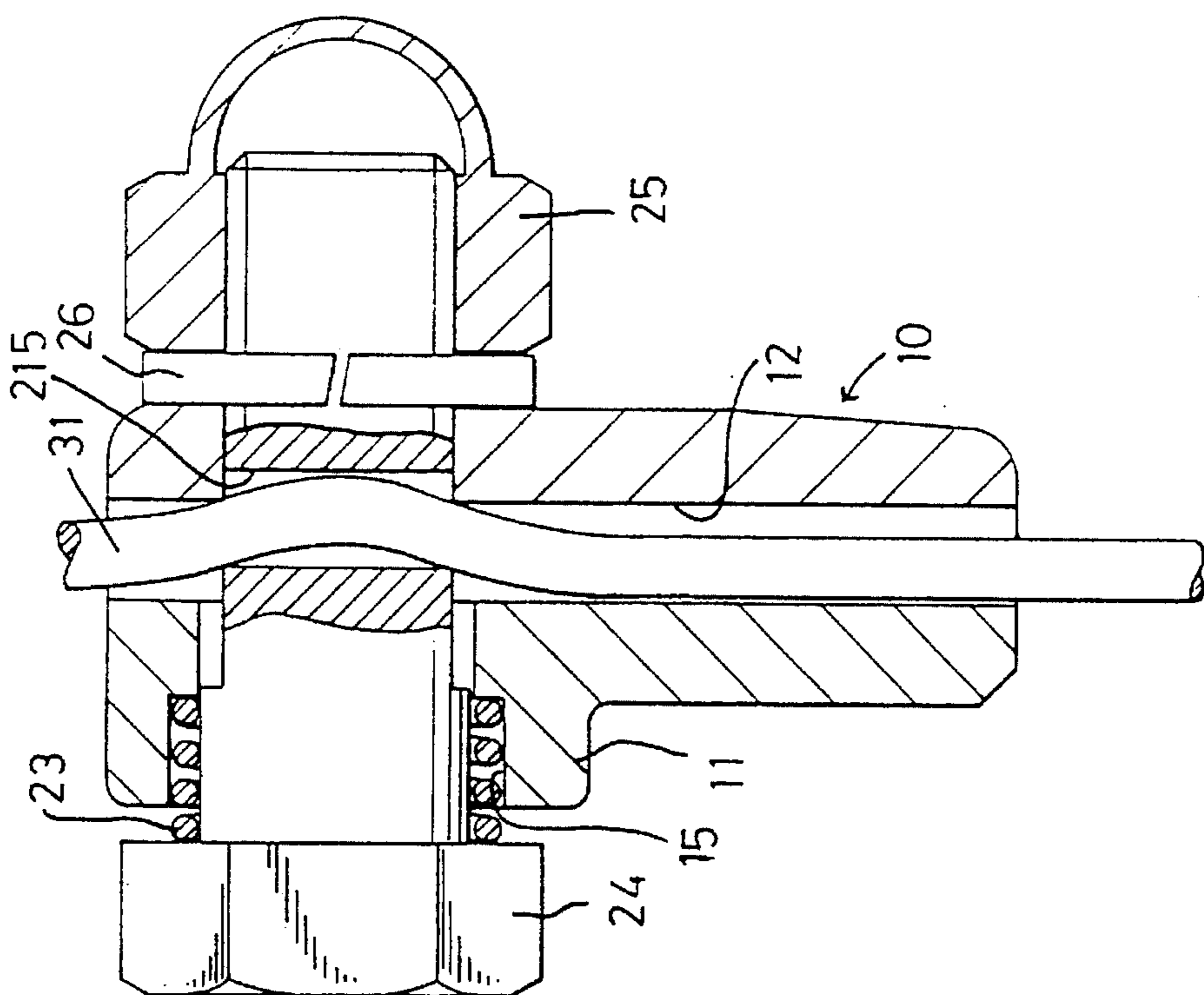


FIG. 6

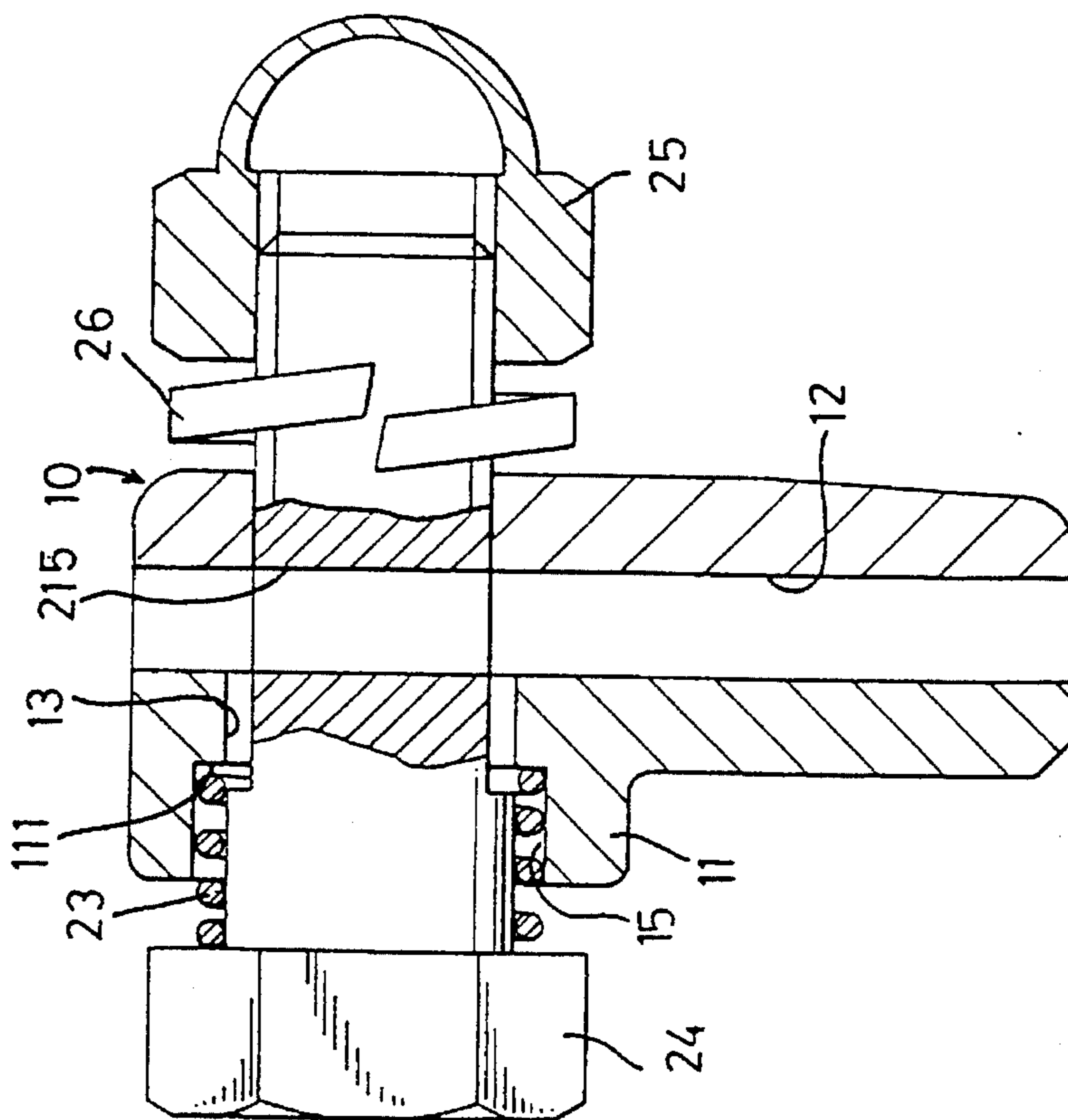


FIG. 5

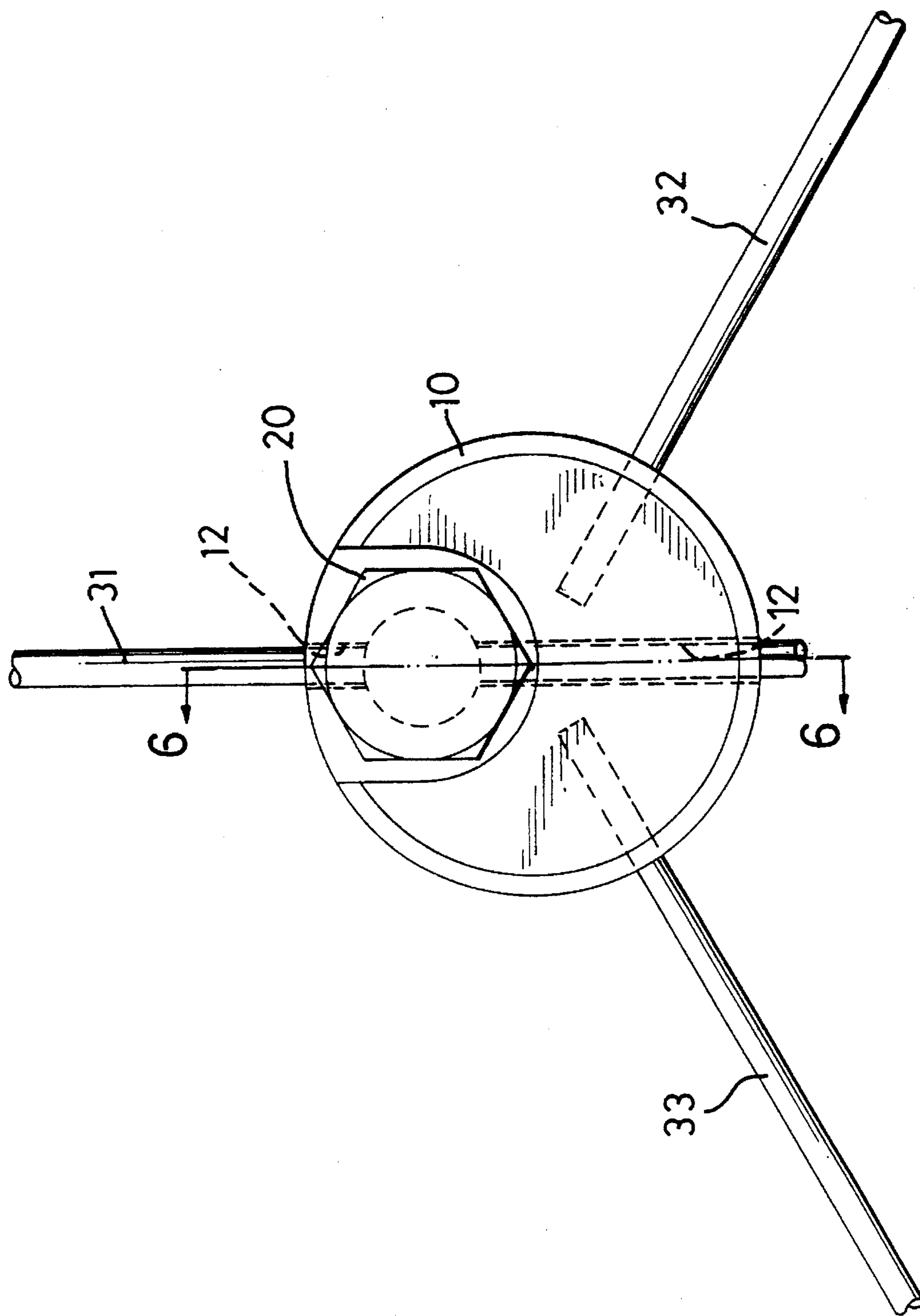


FIG. 7

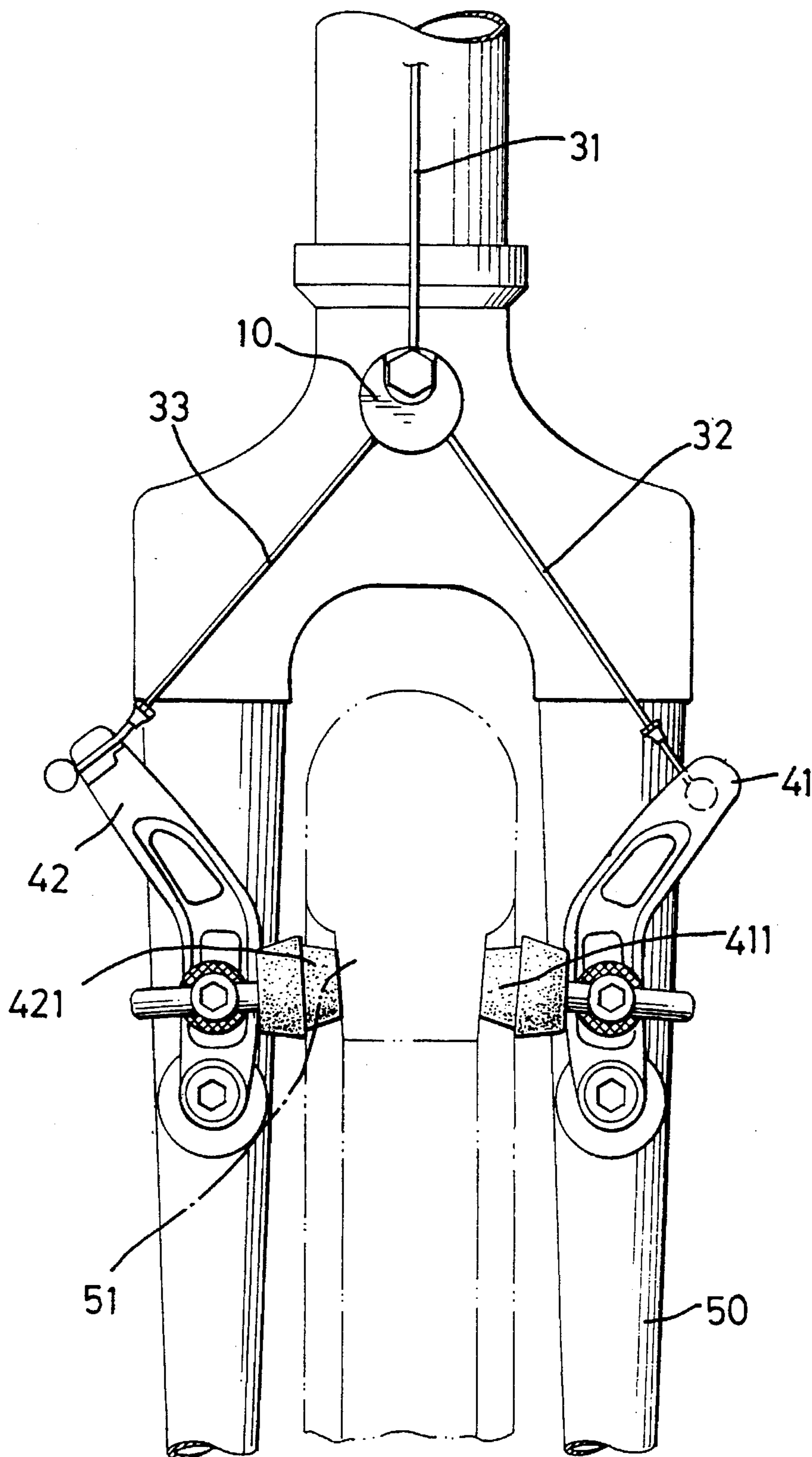


FIG. 8

CONNECTOR FOR ENGAGING BRAKE CABLES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a connector and more particularly, to a connector engaging brake cables of a bicycle.

2. Description of the Prior Art

Referring to FIGS. 1, 2 and 3, a bicycle has two brake arms **80** (only one is shown) each pivotally engaged to a corresponding front fork **90** and positioned between one of two sides of a wheel rim **92** of the bicycle. One of the brake arms **80** is connected to a first brake cable **651** as shown in FIG. 2 and the other brake arm is connected with a second brake cable **652**, both the first and the second brake cables **651**, **652** extend upwardly to connect to a connector **70** which is composed of a cover **74** and a base **75**. The cover **74** has a first hole **72** and a second hole **73** defined therein and, a cut-out **71** is defined in a periphery of the cover **74** above and between the first and the second holes **72**, **73**, the base **75** has a recess **76** defined in a side thereof corresponding to the first hole **72** of the cover **74**, a protrusion **77** extending from the side of the base **75** and corresponding to the second hole **73**, and a first groove **78** defined transversely in the side between the protrusion **77** and the recess **76**, a second groove **79** defined in the side and communicating with the first groove **78** and a cut-out **761** defined in a periphery thereof and communicating with the recess **76**. When assembling the connector **70**, the first brake cable **651** is received in the first groove **78** and extends to a brake lever **93** (see FIG. 3), the second brake cable **652** has a first end with a head **6521** formed thereto which is received in the recess **76** and the head **6521** extends through the first hole **72** of the cover **74** which is engaged to the base **75** by extending the protrusion **77** through the second hole **73** of the cover **74** and then deforming a head of the protrusion **77** extending out of the second hole **73** to fixedly engage the cover **74** and the base **75**, wherein a second end of the second brake cable **652** is pivotally engaged to the brake arm which is not shown in figures. The second brake cable **652** extends out from the connector **70** via the cut-out **761** and the first brake cable **651** is removed from the first groove **78** to the second groove **79** and connected to the brake arm **80** when the brake arm **80** connected thereto is set.

When a rider grasps the brake lever **93**, the connector **70** is pulled upwardly by the first brake cable **651** and the two brake arms **80** are pivoted to stop the wheel rim **92** by a brake block **82** connected to each of the brake arms **80** contacting the wheel rim **92**. However, under such an arrangement, the brake arm **80** connected to the first brake cable **651** tends to bear a larger force from the first brake cable **651** which is directly connected to the brake lever **93** than that of the brake arm connected to the second brake cable **652** such that a position of the brake arm **80** connected to the first brake arm **651** needs to be adjusted by a technician often in order to maintain its suitable position corresponding the brake arm connected to the second brake cable **652**.

The present invention intends to provide a connector which has a first and a second brake cables extending integrally therefrom and a third brake cable securely engaged thereto by a bolt and spring, the third brake cable connected to a brake lever such that when the brake lever is grasped, an equally-distributed force is provided to the first

and the second brake cables to mitigate and/or obviate the above-mentioned problems.

SUMMARY OF THE INVENTION

The present invention provides a connector for engaging brake cables of a bicycle, the connector has a bore defined therein through which a bolt extends and a first hole transversely defined therein which is in communication with and perpendicular to the bore. A first brake cable and a second brake cable respectively extend from the connector and connect to a corresponding brake arm thereof, a third brake cable extending to connect a brake lever at one end thereof and passing through a second hole defined in the bolt and extending through the first hole with the other end thereof, the bolt engaged to a nut via a spring and a washer.

It is an object of the present invention to provide a connector having two brake cables extending therefrom and the two brake cables connected to a corresponding brake arm thereto and a third brake cable fixedly however adjustably engaged thereto so as to provide an equal force to the two brake cables when the third brake cable is pulled up.

Other objects, advantages, and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of a conventional connector and two brake cables connected thereto;

FIG. 2 is a side elevational view, partly in section, of the conventional connector disposed to a brake assembly disposed to a front fork;

FIG. 3 is an illustrative view of the conventional and two brake cable disposed thereto;

FIG. 4 is an exploded view of a connector and a bolt in accordance with the present invention;

FIG. 5 is a side elevational view, partly in section, of the connector and a bolt in accordance with the present invention;

FIG. 6 is a side elevational view, partly in section, of the connector and a bolt through which a third brake cable extends in accordance with the present invention;

FIG. 7 is an illustrative view of the connector and three brake cables; and

FIG. 8 is a front elevational view of the connector and a brake assembly disposed to a front fork of a bicycle.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings and initially to FIG. 4, a connector **10** in accordance with the present invention is a circular body which has a first side **101** and a second side **102**, a first brake cable **32** and a second brake cable **33** extending integrally, inclinedly and downwardly from a periphery **103** of the connector **10**, a tubular portion **11** extending transversely from the first side **101** of the connector **10**, a bore **13** defined in the connector **10** above the first and second brake cables **32**, **33** and communicating with a counter-bore **15** defined within the tubular portion **11**, and a first hole **12** defined in the connector **10** and being perpendicular to and communicating with the bore **13** and extending between the first and second brake cables **32**, **33**. A shoulder **111** is formed between a first periphery **130**

defining the bore **13** and a second periphery **150** defining the counter-bore **15**. Two flats **14** are formed diametrically opposite on the first periphery **130** defining the bore **13**, at an end opposite to the shoulder **111**. A bolt **20** for extending through the bore **13** and counter-bore **15** has a head **24** and a shank **21**, the shank **21** has a first portion **212** integrally formed with the head **24** and a second portion **213** separated from the head **24** by the first portion **212**. Two flats **214** corresponding to the flats **14** of the bore **13** are defined diametrically opposite on a periphery **2120** of the first portion **212**. A second hole **215** is transversely defined through the first portion **212** in communication with the flats **214**. A thread is formed on the second portion **213** of the bolt **20**.

Referring to FIG. 8, the first brake cable **32** and the second brake cable **33** are respectively connected to a corresponding brake arm **41, 42** thereof each of which is pivotally engaged to a front fork **50** of a bicycle (not shown) so as to stop a wheel rim **51** by friction between brake blocks **411, 421** connected to the brake arms **41, 42** and the wheel rim **51**. Referring to FIGS. 5, 6 and 7, a third brake cable **31** has a first end connected to a brake lever (not shown) and a second end thereof extending through the second hole **215** of the bolt **20** and the first hole **12** of the connector **10**. The bolt **20** extends through a spring **23**, the counter-bore **15**, the bore **13** and a washer **26** to threadedly engage to a nut **25** such that the spring **23** is disposed between the head **24** of the bolt **20** and the shoulder **111** and, thus the third cable **31** is fixedly engaged in the connector **10**.

Please refer to FIG. 7 which shows an included angle between the first brake cable **32** and the third brake cable **31** is equal to that between the second brake cable **33** and the third brake cable **31** such that when the third brake cable **31** is pulled upwardly it will exert an equal force to each of the first brake cable **32** and the second brake cable **33**. Furthermore, if an adjustment is required to adjust a distance between the first and the second brake cables **32, 33** and the wheel rim **51**, an operator simply unscrews the bolt **20** and pulls up (or pushes down) the third brake cable **31** to maintain a suitable position of the connector **10**.

Although the invention has been explained in relation to its preferred embodiment, it is to be understood that many other possible modifications and variations can be made without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A connector for engaging brake cables, said connector having a first side and a second side, a bore defined therein, said first side thereof having a tubular portion extending therefrom defining a counter-bore in communication with said bore, a first hole defined in said connector and communicating with said bore;

a first brake cable and a second brake cable respectively extending from a periphery of said connector and said first hole extending between said first brake cable and said second brake cable; and

a bolt positioned in said bore and having a head and a shank, said shank having a first portion and a second portion, said first portion having a second hole transversely defined therein for a third brake cable to extend in said first and second holes said second portion having a thread formed therearound for engagement with a nut.

2. The connector as claimed in claim 1 wherein a shoulder is formed between a first periphery defining said bore and a second periphery defining said counter-bore and, said bolt extends through a spring which is disposed between said shoulder and said head of said bolt in said tubular portion.

3. The connector as claimed in claim 1 wherein a washer for said bolt extending therethrough is disposed between said connector and said nut.

4. The connector as claimed in claim 1 wherein said first brake cable and said third brake cable have an included angle equal to that between said second brake cable and said third brake cable.

5. The connector as claimed in claim 1 wherein said counter-bore has two diametrically opposite flats formed therein and said bolt has two correspondingly formed flats thereon.

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